CONTENTS TO VOLUME 20

NUMBER 1

T. N. Veziroğlu	1	Twenty years of the Hydrogen Movement 1974–1994
S. K. Tiwari, S. Samuel, R. N. Singh, G. Poillerat, J. F. Koenig and P. Chartier	9	Active thin $NiCo_2O_4$ film prepared on nickel by spray pyrolysis for oxygen evolution
C. Alkan, M. Şekerci and Ş. Kunç	17	Production of hydrogen using Fresnel lens–solar electrochemical cell
J. Zaman and A. Chakma	21	A simulation study on the thermal decomposition of hydrogen sulfide in a membrane reactor
E. Bershadsky, A. Klyuch and M. Ron	29	Hydrogen absorption and desorption kinetics of $TiFe_{0.8}Ni_{0.2}H$
Y. Sakamoto, H. Tanaka, F. Sakamoto, F. A. Lewis and X. Q. Tong	35	Self strain gradient induced diffusion of hydrogen in Pd–Ag alloy membranes
A. Jemni and S. Ben Nasrallah	43	Study of two-dimensional heat and mass transfer during absorption in a metal–hydrogen reactor
M. Terzieva, M. Khrussanova, P. Peshev and D. Radev	53	Hydriding and dehydriding characteristics of mixtures with a high magnesium content obtained by sintering and mechanical alloying
A. N. Arshinov, N. I. Vaskov, Y. L. Golin, V. G. Kozin, V. F. Kornilov, L. M. Kuznetsov, A. T. Ovchinnikov and B. S. Pospelov	59	The electrochemical direct current generator for space system Buran
S.-I. Pyun, Y.-G. Yoon and E.-J. Lee	65	Role of hydrogen in the photoresponse of passivating TiO_2 film
S.-I. Pyun and S.-M. Hyun	71	Impedance analysis of polycrystalline *n*-$SrTiO_3$ photoelectrode in 0.1M NaOH solution
S.-G. Lee, Y.-K. Kim and J.-Y. Lee	77	Operating characteristics of metal hydride heat pump using Zr-based Laves phases
Meeting Report		
S. Trasatti	87	Progress in Electrocatalysis—Theory and Practice, Ferrara, Italy, 13–15 September 1993
	89	Calendar of Events
	91	Hydrogen Energy and Energy Related Publications
Announcements	99	*HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994
	100	1995 International Conference on Energy and Environment, Shanghai, China, 8–10 May 1995
	101	First International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12–15 June 1995
	102	HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995
	103	New Materials for Fuel Cells Systems International Symposium, Montreal, Canada, 9–13 July 1995

104 ECOS '95, Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems, Istanbul, Turkey, 11–14 July 1995
105 6th International Frumkin Symposium, Fundamental Aspects of Electrochemistry, Moscow, Russia, 21–25 August 1995
106 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
107 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
108 Energex '96, The Sixth International Energy Conference and Exposition, Beijing, China, 3–7 June 1996; 35th IUPAC Congress, Istanbul, Turkey, 14–19 August 1995
109 International Association for Hydrogen Energy

NUMBER 2

J. J. Podestá, R. C. V. Piatti and A. J. Arvia 111 The influence of iridium, ruthenium and palladium on the electrochemical behaviour of Co–P and Ni–Co–P base amorphous alloys for water electrolysis in KOH aqueous solutions

Ch. Sasikala, Ch. V. Ramana and P. Raghuveer Rao 123 Regulation of simultaneous hydrogen photoproduction during growth by pH and glutamate in *Rhodobacter sphaeroides* O.U. 001

G. C. De, A. M. Roy and S. S. Bhattacharya 127 Photocatalytic production of hydrogen and concomitant cleavage of industrial waste hydrogen sulphide

G. Biggiero, A. Borruto and F. Gaudino 133 Embrittlement due to hydrogen in ferritic and martensitic structural steels

Ming Au, Jing Wu and Qidong Wang 141 The hydrogen storage properties and the mechanism of the hydriding process of some multicomponent magnesium-base hydrogen storage alloys

M. N. Mungole, R. Balasubramaniam and K. N. Rai 151 Hysteresis in $MmNi_5$ systems with aluminium, manganese and tin substitutions

T. A. Solomina, R. Kh. Ibrasheva, G. I. Leonova, V. P. Mordovin, K. A. Zhubanov and B. D. Turganbaev 159 Prospects of catalytic reduction of aromatic nitrocompounds by hydrogen

D. Vyas and H. D. Kumar 163 Nitrogen fixation and hydrogen uptake in four cyanobacteria

H. R. Hinds 169 Hydrogen Energy News and Views
173 Calendar of Events

Announcements
175 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994
176 IHCE '95, International Hydrogen and Clean Energy Symposium '95, Keidanren Hall, Tokyo, Japan, 6–8 February 1995
177 First International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12–15 June 1995

178 HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995
179 Gordon Research Conference on Hydrogen–Metal Systems, New England College, Henniker, New Hampshire, U.S.A., 16–21 July 1995
180 The Second International Conference on New Energy Systems and Conversions, Istanbul, Turkey, 31 July–4 August 1995
181 First International Conference on Hydrogen Treatment of Materials (HTM-95), Donetsk, Ukraine, 20–22 September 1995
182 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
183 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
185 International Association for Hydrogen Energy

NUMBER 3

A. M. MEZIOU, P. B. DESHPANDE and I. M. ALATIQI — 187 Dynamic matrix control of an industrial steam gas reformer

A. Z. BAGAUTDINOV, V. K. JIVOTOV, J. I. EREMENKO, I. A. KALACHEV, S. A. MUSINOV, B. V. POTAPKIN, A. M. PAMPUSHKA, V. D. RUSANOV, M. I. STRELKOVA, A. A. FRIDMAN and V. A. ZOLLER — 193 Plasma chemical production of hydrogen from H_2S-containing gases in MCW discharge

L. FULCHERI and Y. SCHWOB — 197 From methane to hydrogen, carbon black and water

S. P. SINGH, R. N. SINGH, G. POILLERAT and P. CHARTIER — 203 Physicochemical and electrochemical characterization of active films of $LaNiO_3$ for use as anode in alkaline water electrolysis

S. KUMAR and R. BALASUBRAMANIAM — 211 Theoretical analysis of hysteresis during hydrogen transformations in the vanadium–hydrogen system

MYOUNG YOUP SONG — 221 Effects of mechanical alloying on the hydrogen storage characteristics of Mg–$x$wt% Ni (x = 0, 5, 10, 25 and 55) mixtures

H. KRAMER, M. LEVY and A. WARSHAWSKY — 229 Hydrogen storage by the bicarbonate/formate reaction. Studies on the activity of Pd catalysts

CHEN JUN and ZHANG YUNSHI — 235 Nickel/metal hydride batteries using micro-encapsulated hydrogen storage alloy

J. W. HOLLENBERG, E. N. CHEN, K. LAKERAM and D. MODROUKAS — 239 Development of a photovoltaic energy conversion system with hydrogen energy storage

Short Communication

W.-K. HU, P.-W. SHEN, Y.-S. ZHANG, G.-S. WANG, D.-Y. SONG and Z.-X. ZHOU — 245 Application of ion beam sputtering to electrocatalysts of hydrogen storage alloy

247 Calendar of Events

Announcements

249 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

250 Second European East West Workshop on Chemistry and Energy, Sintra, Portugal, 12–15 March 1995
251 1995 International Conference on Energy and Environment, Shanghai, China, 8–10 May 1995
252 First International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12–15 June 1995
253 HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995
254 New Materials for Fuel Cell Systems International Symposium, Montreal, Canada, 9–13 July 1995
255 6th International Frumkin Symposium, Fundamental Aspects of Electrochemistry, Moscow, Russia, 21–25 August 1995
256 ECOS '95, Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems, Istanbul, Turkey, 11–14 July 1995
257 Gordon Research Conference on Hydrogen–Metal Systems, Henniker, New Hampshire, U.S.A., 16–21 July 1995
258 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
259 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
261 International Association for Hydrogen Energy

NUMBER 4

M. M. JAKSIC 263 In Memoriam—Jomar Brun
M. M. JAKSIC, J. BRUN, B. JOHANSEN and R. TUNOLD 265 Some specific potentiodynamic features of nickel electrodes in alkaline aqueous media
J. ROTHSTEIN 275 Nuclear energy, environmental problems and the hydrogen energy economy
J. ROTHSTEIN 283 Hydrogen and fossil fuels
K. GURUNATHAN and P. MARUTHAMUTHU 287 Photogeneration of hydrogen using visible light with undoped/doped α-Fe_2O_3 in the presence of methyl viologen
M. SAKURAI, A. TSUTSUMI and K. YOSHIDA 297 Improvement of Ca-pellet reactivity in UT-3 thermochemical hydrogen production cycle
S. A. NAMAN, N. H. AL-MISHHADANI and L. M. AL-SHAMMA 303 Photocatalytic production of hydrogen from hydrogen sulfide in ethanolamine aqueous solution containing semiconductors dispersion
W. KLOSE and V. STUKE 309 Investigation of the thermodynamic equilibrium in the hydrogen–magnesium–magnesium hydride system
S. J. LEE, H. S. YI and E. S. KIM 317 Combustion characteristics of intake port injection type hydrogen fueled engine
H. R. HINDS 323 Hydrogen Energy News and Views
327 Calendar of Events

Announcements

329 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

330 First International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12–15 June 1995

331 HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995

332 Gordon Research Conference on Hydrogen–Metal Systems, New England College, Henniker, New Hampshire, U.S.A., 16–21 July 1995

333 The Second International Conference on New Energy Systems and Conversions, Istanbul, Turkey, 31 July–4 August 1995

334 First International Conference on Hydrogen Treatment of Materials (HTM-95), Donetsk, Ukraine, 20–22 September 1995

335 III International Congress, Energy, Environment and Technological Innovations, Caracas, Venezuela, 6–11 November 1995

336 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995

337 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995

338 Energex '96, The Sixth International Energy Conference and Exposition, Beijing, China, 3–7 June 1996; 35th IUPAC Congress, Istanbul, Turkey, 14–19 August 1995

339 International Association for Hydrogen Energy

NUMBER 5

SPECIAL ISSUE

PROCEEDINGS OF THE SELECTED PAPERS OF THE THIRD INTERREPUBLIC CONFERENCE ON HYDROGEN MATERIAL SCIENCES AND CHEMISTRY OF METAL HYDRIDES

Guest Editor
Dmitry V. Schur

Z. A. MATYSINA and S. YU. ZAGINAICHENKO 341 Hydrogen bicomplexes and crowdions in metals and alloys with face-centered cubic structure

O. K. ALEXEEVA, N. L. ILTCHENKO, L. D. HARITONOVA, V. N. SUMAROKOV, B. L. SHAPIR and E. A. VINOGRADOVA 347 Interaction between the $LaNi_5$-type intermetallic compound and hydrogen sulfide

T. I. BRATANICH, S. M. SOLONIN and V. V. SKOROKHOD 353 Mechanical activation of hydrogen sorption with intermetallic compounds $LaNi_5$ and TiFe in powder systems

Yu. F. Shmal'ko, V. V. Solovey, M. V. Lototsky and Ye. V. Klochko	357	Mass spectrometry determination of vibrationally excited states of molecules of hydrogen desorbed from the surface of metal hydrides
O. V. Slobodyan and E. E. Krasovskii	361	Theoretical study of ultraviolet photoemission spectra of transition metal dihydrides
F. A. Lewis, Y. Sakamoto and X. Q. Tong	365	Strain gradient effects on hydrogen permeation through hydrided metals
F. A. Lewis, K. Kandasamy, R.-A. McNicholl and X. Q. Tong	369	Hydrogen pressure–hydrogen content and electrical resistance–hydrogen content relationships of palladium and palladium alloy–hydrogen systems
E. E. Krasovskii, V. V. Nemoshkalenko, G. F. Kobzenko and V. N. Antonov	373	Electronic structure of early transition metal dihydrides and hypothetical ScH_3, TiH_3 and VH_3 compounds
V. N. Bilichenko, V. V. Skopenko, V. A. Makara, A. P. Arbuzova, I. V. Lysova and G. F. Kobzenko	377	Some peculiarities of oxidative dehydrogenation of TiH_2 as a component of bioradioprotective composites
G. F. Kobzenko, A. P. Kobzenko, M. V. Chubenko, V. V. Pet'kov and A. V. Polenur	383	Crystal structure change of titanium hydride desorption products in helium
V. N. Fokin, Yu. I. Malov, E. E. Fokina, S. L. Troitskaya and S. P. Shilkin	387	Investigations of interactions in the TiH_2–O_2 system
S. K. Dolukhanyan, A. G. Aleksanian and A. G. Hakobian	391	Interaction of hafnium with hydrogen and nitrogen in the combustion regime
O. K. Alexeeva, A. Chistov and V. Sumarokov	397	Preparation of hydride-forming intermetallic films
A. I. Stegniy, Yu. F. Zabashta and A. Ya. Fridman	401	Internal friction of composite polymer materials—plastic foams
D. V. Schur, A. A. Lyashenko, V. M. Adejev, V. B. Voitovich and S. Yu. Zaginaichenko	405	Niobium as a construction material for a hydrogen energy system
	409	Calendar of Events
Announcements	411	*HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994
	412	1995 Canadian Hydrogen Meeting, Canadian Hydrogen Association's 7th Canadian Hydrogen Workshop, Loews Le Concorde Hotel, Quebec City, Canada, 4–6 June 1995
	413	First International Conference on Advances in Strategic Technologies, Bangi, Selangor, Malaysia, 12–15 June 1995
	414	HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995
	415	New Materials for Fuel Cell Systems, an International Symposium, Hotel Bonaventure-Hilton, Montreal, Canada, 9–13 July 1995
	416	ECOS '95, Efficiency, Costs, Optimization, Simulation and Environmental Impact of Energy Systems, Istanbul, Turkey, 11–14 July 1995
	417	Gordon Research Conference on Hydrogen–Metal Systems, New England College, Henniker, New Hampshire, U.S.A., 16–21 July 1995

418 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
419 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
420 Trabzon International Symposium on Energy and Environment 96, Karadeniz Technical University, Trabzon, Turkey, 24–26 July 1996
421 International Association for Hydrogen Energy

NUMBER 6

M. J. De Giz, G. Tremiliosi-Filho, E. R. Gonzalez, S. Srinivasan and A. J. Appleby — 423 The hydrogen evolution reaction on amorphous nickel and cobalt alloys

A. A. Panteleimonova — 429 The present state of sulphuric acid thermal decomposition

M. F. Kibria, M. Sh. Mridha and A. H. Khan — 435 Electrochemical studies of a nickel electrode for the hydrogen evolution reaction

S. Devanathan, B. Lakshmi Brinda, K. S. Dhathathreyan, S. Parthasarathy and V. Srinivasan — 441 Hydrogen absorption–desorption studies with hydrogen storage unit ST-90[R] containing the alloy $MmNi_{4.6}Al_{0.4}$

A. M. Prognimak — 449 Mass-spectrometry investigation on the effect of metal-hydride activation of molecular hydrogen

K. Kandasamy — 455 Influences of self-induced stress on permeation flux and space–time variation of concentration during diffusion of hydrogen in a palladium alloy

G. Biggiero, A. Borruto and I. Taraschi — 465 Effects of hydrogen charging methods on ductility and fracture characteristics of AISI 9840 steel

M. A. K. Lodhi — 471 A hybrid system of solar photovoltaic, thermal and hydrogen: a future trend

J. Quakernaat — 485 Hydrogen in a global long-term perspective

K. P. De Jong and H. M. H. Van Wechem — 493 Carbon: hydrogen carrier or disappearing skeleton?

Technical Communication

W. Seifritz — 501 Optimum CO_2 management of the atmosphere

Book Review

D. G. Lovering — 507 *Fuel Cell Systems.* Edited by L. J. M. J. Blomen and M. N. Mugerwa

509 Calendar of Events

Announcements

511 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

512 1995 Canadian Hydrogen Meeting, Canadian Hydrogen Association's 7th Canadian Hydrogen Workshop, Loews Le Concorde Hotel, Quebec City, Canada, 4–6 June 1995

513 HYPOTHESIS, HYdrogen POwer (THermal & Electrochemical) Systems International Symposium, Cassino-Gaeta, Italy, 26–29 June 1995

514 New Materials for Fuel Cell Systems, an International Symposium, Hotel Bonaventure-Hilton, Montréal, Canada, 9–13 July 1995
515 Gordon Research Conference on Hydrogen–Metal Systems, New England College, Henniker, New Hampshire, U.S.A., 16–21 July 1995
516 The Second International Conference on New Energy Systems and Conversions, Istanbul, Turkey, 31 July–4 August 1995
517 ICHMS '95, 4th International Conference on Hydrogen Materials Science and Chemistry of Metal Hydrides, Katsiveli, Yalta, Ukraine, 2–8 September 1995
518 First International Conference on Hydrogen Treatment of Materials (HTM-95), Donetsk, Ukraine, 20–22 September 1995
519 International Association for Hydrogen Energy

NUMBER 7

R. E. Billings and M. Sanchez 521 Solid polymer fuel cells: an alternative to batteries in electric vehicles—an overview

D. G. Lovering 531 Third Grove Fuel Cell Symposium: platinum metals-loaded polymer membrane fuel cells progress to electric traction

S. Tanisho and Y. Ishiwata 541 Continuous hydrogen production from molasses by fermentation using urethane foam as a support of flocks

M. A. Rosen 547 Energy and exergy analyses of electrolytic hydrogen production

M.-H. Wang, R.-J. Guo, T.-L. Tso and T.-P. Perng 555 Effects of sintering on the photoelectrochemical properties of Nb-doped TiO_2 electrodes

R.-J. Guo, M.-H. Wang, T.-L. Tso and T.-P. Perng 561 Photoelectrochemical properties of sulfidized TiO_2 electrodes

S. Sen, R. Balasubramaniam and R. Sethuraman 567 Finite element evaluation of elastic accommodation energies during room temperature α–β hydrogen transformations in the niobium–hydrogen system: plane stress formulation

J. P. Vanhanen and P. D. Lund 575 Computational approaches for improving seasonal storage systems based on hydrogen technologies

F. A. Lewis 587 The palladium–hydrogen system: structures near phase transition and critical points

Y. Tsujikawa and G. B. Northam 593 Optimization of scramjet engine performance with the three-temperature flow model

Y. Matsuno, A. Tsutsumi and K. Yoshida 601 Characteristics of three-dimensional electrodes for a molten carbonate fuel cell anode

M. R. Gopal and S. S. Murthy 607 Prediction of metal-hydride refrigerator performance based on reactor heat and mass transfer

615 Calendar of Events

Announcements 617 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

618 6th International Frumkin Symposium, Fundamental Aspects of Electrochemistry, Moscow, Russia, 21–25 August 1995
619 Third International Energy and Environmental Sciences Conference, Caribe Hilton Hotel, San Juan, Puerto Rico, 9–16 September 1995
620 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
621 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
622 MPC '95, Mediterranean Petroleum Conference and Exhibition, Tripoli, Libya, 26–29 November 1995
623 Hydrogen '96, 11th World Hydrogen Energy Conference, Stuttgart, Germany, 23–28 June 1996
624 Trabzon International Symposium on Energy and Environment '96, Karadeniz Technical University, Trabzon, Turkey, 24–26 July 1996
625 International Association for Hydrogen Energy

NUMBER 8

A. M. Roy, G. C. De, N. Sasmal and S. S. Bhattacharyya 627 Determination of the flatband potential of semiconductor particles in suspension by photovoltage measurement

S. Patel and D. Madamwar 631 Continuous hydrogen evolution by an immobilized combined system of *Phormidium valderianum, Halobacterium halobium* and *Escherichia coli* in a packed bed reactor

E. Ndzebet and O. Savadogo 635 Study of the hydrogen evolution reaction in a basic medium on palladium highly dispersed in graphite electrodes electro-activated with $SiW_{12}O_{40}^{4-}$ (STA)

X. Q. Tong and F. A. Lewis 641 Indications of linearity deviations of steady-state concentration profiles in hydrogen permeation membranes

A. K. Singh, A. K. Singh and O. N. Srivastava 647 On the synthesis, characterisation and hydrogenation behaviour of V–Ti–Fe alloy

S. Stucki, A. Schuler and M. Constantinescu 653 Coupled CO_2 recovery from the atmosphere and water electrolysis: feasibility of a new process for hydrogen storage

B. H. Kang and A. Kuznetsov 665 Thermal modelling and analysis of a metal hydride chiller for air conditioning

H. R. Hinds 675 Hydrogen Energy News and Views
679 Calendar of Events

Announcements
681 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994
682 ICHMS '95, 4th International Conference on Hydrogen Materials Science and Chemistry of Metal Hydrides, Katsiveli, Yalta, Ukraine, 2–8 September 1995

683 Third International Energy and Environmental Sciences Conference, Caribe Hilton Hotel, San Juan, Puerto Rico, 9–16 September 1995
684 First International Conference on Hydrogen Treatment of Materials (HTM-95), Donetsk, Ukraine, 20–22 September 1995
685 Minia First Conference in Engineering and Technology, MFCET '95, Minia University, Minia, Egypt, 8–10 October 1995
686 III International Congress, Energy, Environment and Technological Innovations, Caracas, Venezuela, 6–11 November 1995
687 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
688 MPC '95, Mediterranean Petroleum Conference and Exhibition, Tripoli, Libya, 26–29 November 1995
689 Hydrogen '96, 11th World Hydrogen Energy Conference, Stuttgart, Germany, 23–28 June 1996
690 TIEES-96, First Trabzon International Energy and Environment Symposium, Karadeniz Technical University, Trabzon, Turkey, 29–31 July 1996
691 International Association for Hydrogen Energy

NUMBER 9

E. I. ONSTOTT 693 Cerium dioxide as a recycle reagent for thermochemical hydrogen production by modification of the sulfur dioxide–iodine cycle

V. M. ROSA, M. B. F. SANTOS and E. P. DA SILVA 697 New materials for water electrolysis diaphragms

C. A. LINKOUS, N. Z. MURADOV and S. N. RAMSER 701 Consideration of reactor design for solar hydrogen production from hydrogen sulfide using semiconductor particulates

Y.-T. PARK, S.-G. LEE and Y.-U. KIM 711 Light-induced hydrogen and oxygen generation from water

C. P. BADRA 717 Porous membrane reactors for hydrogen sulfide splitting

M. AL-GARNI 723 A simple and reliable approach for the direct injection of hydrogen in internal combustion engines at low and medium pressures

M. GHOUSE, A. AL-BOEIZ, H. ABAOUD and M. AL-GARNI 727 Preparation and evaluation of PTFE-bonded porous gas diffusion carbon electrodes used in phosphoric acid fuel cell applications

R. L. HOEKSTRA, K. COLLIER, N. MULLIGAN and L. CHEW 737 Experimental study of a clean burning vehicle fuel

747 Calendar of Events

Announcements 749 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

750 Third International Energy and Environmental Sciences Conference, Caribe Hilton Hotel, San Juan, Puerto Rico, 9–16 September 1995

751 Minia First Conference in Engineering and Technology, MFCET '95, Minia University, Minia, Egypt, 8–10 October 1995
752 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995
753 International Symposium on Energy, Environment and Economics, Melbourne, Victoria, Australia, 20–24 November 1995
754 MPC 95, Mediterranean Petroleum Conference and Exhibition, Tripoli, Libya, 26–29 November 1995
755 Hydrogen '96, 11th World Hydrogen Energy Conference, Stuttgart, Germany, 23–28 June 1996
756 Trabzon International Symposium on Energy and Environment 96, Karadeniz Technical University, Trabzon, Turkey, 24–26 July 1996
757 International Association for Hydrogen Energy

NUMBER 10

G. NICOLETTI 759 The hydrogen option for energy: a review of technical, environmental and economic aspects

T. K. KHANMAMEDOV 767 The origin of hydrocarbons and water. The role of hydrogen

K. S. CHANDRA BABU, R. N. PANDEY and O. N. SRIVASTAVA 771 Photoelectrochemical semiconductor septum (CdSe/Ti and TiO_2/Ti) solar cells in relation to hydrogen production

A. A. ADESINA, V. MEEYOO and G. FOULDS 777 Thermolysis of hydrogen sulphide in an open tubular reactor

T. BERGENE 785 Trapping of minority charge carriers at irradiated semiconductor/electrolyte heterojunctions

Y.-T. PARK and S.-G. NOH 789 Photo-production of hydrogen from an aqueous solution of photosensitizer vesicles

A. STEINFELD, A. FREI, P. KUHN and D. WUILLEMIN 793 Solar thermal production of zinc and syngas via combined ZnO-reduction and CH_4-reforming processes

MYOUNG-YOUP SONG and HYE-RYOUNG PARK 805 Hydriding kinetics of Mg_2Ni below the polymorphic transformation temperature of Mg_2NiH_4

B. BOGDANOVIĆ, A. RITTER, B. SPLEITHOFF and K. STRAßBURGER 811 A process steam generator based on the high temperature magnesium hydride/magnesium heat storage system

T. SUZUKI, H.-I. IWANAMI, T. YOSHIZAWA, H. YAMAZAKI and Y. YOSHIDA 823 Selective hydrogenation of CO_2 to CO in the presence of excess CO on a MoO_3/ZnO catalyst—a preliminary attempt to yield an equimolecular mixture of H_2 and CO

D. KUSUNOKA, Y. KIKUOKA, V. YANAGI, K. KUGIMIYA, M. YOSHINO, M. TOKURA, K. WATANABE, H. MIYAMOTO, S. UEDA, M. SUMI and S. TOKUNAGA 831 Development of Mitsubishi–planar reversible cell—fundamental test on hydrogen-utilized electric power storage system

S. TRASATTI 835 Electrochemistry and environment: the role of electrocatalysis

L. P. L. M. RABOU 845 Modelling of a variable-flow methanol reformer for a polymer electrolyte fuel cell

J. S. HUANG, Z. X. ZHOU, W. K. HU, F. Y. YAO and D. Y. SONG — 849 Short communication: hydrogen diffusion studies of microcrystalline $LaNi_{3.94}Si_{0.54}$ films using the electrochemical permeation technique

853 Calendar of Events

Announcements

855 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

856 First European Solid-Oxide Fuel Cell Forum

857 III International Congress, Energy, Environment and Technological Innovations, Caracas, Venezuela, 6–11 November 1995

858 International Conference on Towards Relatively Sustainable Energy and Mineral Resource Development in Developing Countries, Hat Yai, Thailand, 8–10 November 1995

859 International Symposium on Energy, Environment and Economics, The University of Melbourne, Victoria, Australia, 20–24 November 1995

860 MPC 95, Mediterranean Petroleum Conference and Exhibition, Tripoli, Libya, 26–29 November 1995

861 ENERGEX '96, The Sixth International Energy Conference and Exposition, Beijing, China, 3–7 June 1996

862 First Trabzon International Energy and Environment Symposium (TIESS-96), Karadeniz Technical University, Trabzon, Turkey, 29–31 July 1996

863 International Association for Hydrogen Energy

NUMBER 11

N. OUELLETTE, H.-H. ROGNER and D. S. SCOTT — 865 Hydrogen from remote excess hydroelectricity. Part I: Production plant capacity and production costs

N. OUELLETTE, H.-H. ROGNER and D. S. SCOTT — 873 Hydrogen from remote excess hydroelectricity. Part II: Hydrogen peroxide of biomethanol

A. JEMNI and S. BEN NASRALLAH — 881 Study of two-dimensional heat and mass transfer during desorption in a metal–hydrogen reactor

A. Y. ESAYED and D. O. NORTHWOOD — 893 Thermodynamic characterization of $(Nb_{1-x}Fe_x)_{1-x}Cr_x$–H systems

M. T. HAGSTRÖM, P. D. LUND and J. P. VANHANEN — 897 Metal hydride hydrogen storage for near-ambient temperature and atmospheric pressure applications, a PDSC study

M. RAM GOPAL and S. SRINIVASA MURTHY — 911 Studies on heat and mass transfer in metal hydride beds

Z. LIU and G. A. KARIM — 919 Knock characteristics of dual-fuel engines fuelled with hydrogen fuel

Book Reviews

M. V. C. SASTRI — 925 *The Future of Energy Gases.* Edited by David G. Howell

M. V. C. SASTRI — 926 *Hydrogen Energy Progress—X (Proceedings, 10th World Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994).* Edited by D. L. Block and T. N. Veziroğlu

M. V. C. SASTRI — 928 *Energy Technology.* By Tokio Ohtas

M. V. C. SASTRI 929 *Nuclear Power at the Crossroads: Challenges and Prospects for the Twenty First Century.* Edited by T. C. Lowinger and G. W. Hinman

931 Calendar of Events

Announcements

933 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

934 International Symposium on Energy, Environment and Economics, The University of Melbourne, Victoria, Australia, 20–24 November 1995

935 National Hydrogen Association, The 7th Annual U.S. Hydrogen Meeting, Alexandria, VA, U.S.A., 2–4 April 1996

936 First Trabzon International Energy and Environment Symposium (TIEES-96), Karadeniz Technical University, Trabzon, Turkey, 29–31 July 1996

NUMBER 12

DAVID SANBORN SCOTT
ROBERT A. HEFNER III 939 Whales and whisky barrels

945 Toward sustainable economic growth: the age of energy gases

N. E. AMADEO and M. A. LABORDE 949 Hydrogen production from the low-temperature water–gas shift reaction: kinetics and simulation of the industrial reactor

B. YAZICI, G. TATLI, H. GALIP and M. ERBIL 957 Investigation of suitable cathodes for the production of hydrogen gas by electrolysis

J. WEITKAMP, M. FRITZ and S. ERNST 967 Zeolites as media for hydrogen storage

D. K. SLATTERY 971 The hydriding–dehydriding characteristics of La_2Mg_{17}

P. A. OKKEN*, P. LAKO and J. R. YBEMA 975 Cost effective integration of hydrogen in energy systems with CO_2 constraints

J. S. CANNON and S. L. AZIMI 987 Reformulated gasoline: cleaner air on the road to nowhere

995 Calendar

Announcements

997 *HYDROGEN ENERGY PROGRESS X,* Proceedings 10th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., 20–24 June 1994

998 *New Materials for Fuel Cell Systems I.* Proceedings of the First International Symposium on New Materials for Fuel Cell Systems, Montreal, Quebec, Canada, 9–13 July 1995

999 First Trabzon International Energy and Environment Symposium (TIEES-96), Karadeniz Technical University, Trabzon, Turkey, 29–31 July 1996

1000 International Symposium on Metal Hydrogen Systems, Fundamentals and Applications, Les Diablerets, Switzerland, 25–30 August 1996

1001 International Association for Hydrogen Energy

i Index to Vol. 20, 1995